



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/692,156	10/20/2000	Min-Cheol Hong	630-1165P	7914

7590 02/06/2004

Birch Stewart Kolasch & Birch LLP
P O Box 747
Falls Church, VA 22040-0747

EXAMINER

LE, BRIAN Q

ART UNIT	PAPER NUMBER
----------	--------------

2623

DATE MAILED: 02/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/692,156

Applicant(s)

HONG ET AL.

Examiner

Brian Q Le

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 8, 10 and 15 is/are rejected.
- 7) ☒ Claim(s) 4-7, 9, 11-14 and 16-18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

Response to Amendment and Arguments

1. Applicant's amendment filed January 22, 2004, has been entered and made of record.
2. The claim 3's objection and rejection under 35 U.S.C. 112, 2nd paragraph is withdrawn.
3. Applicant's arguments with regard to claims 1-18 have been fully considered, but are not considered persuasive because of the following reasons:

For claim 1, the Applicant argues (on page 11) that Yuen fails to show the finding of an added filter coefficient Q of in the Point Spread Function (PSF) and fails to show the finding of a bi-linear interpolation filter from the claimed equation $f = Pg = PBz = Qz$. The Examiner points out that the rejections were based upon the entire reference. Therefore, Applicant is urged to consider the reference as a whole. When considering the cited portions within context the whole patent, it is seen that the claimed invention is rendered obvious. As indicated by the Examiner, Yuen may not disclose the exact equation or exact language usage as the claimed limitation. However, all the claimed invention concepts are clearly discussed by Yuen. Also, Yuen indicates a similar equation (column 6, lines 1-10) and the usage of bi-linear interpolation filter to obtain/recover a high resolution image (column 6, lines 45-50). Thus, it would have been obvious for one skilled in the art to apply bi-linear interpolation filter into the claimed equation as a designer choice to improve the resolution of the image.

The Applicant also argues (bottom of page 11) that reference taught by Pattie also fails to cure the deficiencies taught by Yuen. However, the Examiner is not intended to use Pattie's reference to show the bi-linear interpolation filter concept with the claimed equation.

Thus, the rejections of all of the claims are maintained.

Art Unit: 2623

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 3, 8 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yuen U.S. Patent No. 5,949,914.

Regarding claim 1, Yuen teaches a filtering control method for improving the image quality of a bilinear interpolated image in methods for getting a high resolution image from a low resolution image (abstract; column 2, lines 15-35; and column 6, lines 45-50), comprising:

Restoring a requested high-resolution image f by using Point Spread Function (PSF) with the low-resolution image (column 6, lines 1-9). Yuen does not clearly indicate the usage of bi-linear interpolation filter in his equation. Nevertheless, Yuen indicates that bilinear interpolation can be used to restore high-resolution image by interpolating the pixel value (column 6, lines 45-50). Therefore, it would have been obvious for one skilled in the art to restore high-resolution image by using a bi-linear interpolation filter from an equation with PSF and the low-resolution image to improve the resolution of an image.

For claim 3, Yuen further teaches the filtering control for improving the image quality of the bi-linear interpolated image wherein the high resolution image f is restored by find a PSF whereas a high resolution image is computed by PSF and high resolution image found by the interpolation method (f^n , the latest and previous estimated restored image) (column 6, lines 1-55 and column 7, lines 1-24).

Art Unit: 2623

Regarding claim 8, Yuen further teaches the filtering control method for improving the image quality of the bi-linear interpolated image with an up-sampling value of the image (column 6, lines 40-43).

Regarding claim 15, please refer back to claim 8 for the explanation.

6. Claims 2 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yuen U.S. Patent No. 5,949,914 as applied to claim 1 above, and further in view of Patti U.S. Patent No. 5,696,848.

Regarding claim 2, Yuen does not take noise component as a factor in the equation to generate high-resolution image. However, Patti discloses a method of restoring high resolution image (abstract) with the consideration of noise as a factor in the equation to generate high resolution image (column 15, lines 51-57). Modifying Yuen's method of restoring high-resolution image according to Yuen would be able to consider noise as a factor in the equation of generating high resolution image to enhance the smoothness and thus improves the quality of the image (column 15, lines 50-56). This would improve processing and therefore, it would have been obvious to one of the ordinary skill in the art to modify Yuen according to Patti.

Regarding claim 10, please refer back to claims 1-3 for further explanation.

Allowable Subject Matter

7. Claims 4-7, 9, 11-14 and 16-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Art Unit: 2623

Contact Information

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Q Le whose telephone number is 703-305-5083. The examiner can normally be reached on 8:30 A.M - 5:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

BL
February 5, 2004



SAMIR AHMED
PRIMARY EXAMINER